

REMARKS

The claims have been carefully reviewed in light of the Examiner's action.

Allowance of claims 9, 10, 27/9 and 27/10 is gratefully noted.

After a personal interview with the Examiner on May 11, 2004 , claims 6 and 26 have been rewritten and combined with claims 1, 2 and 3, as new independent claims 31- 35, as requested by the Examiner. (Claim 6 was combined with 1 and 3 into 31 and 32 ; and claim 26 was combined with 1,2, and 3 into 33, 34, and 35).

It was also agreed during the interview to remove from claims 1,2, and 3 the last sentence : " ,which does not have said electric propulsion system.", as unnecessary.

After applicant's explanation of the differences between the instant invention as claimed in claims 27/1 , 27/3 , 29 and 30, and the prior art, the Examiner agreed to reconsider their rejection. Applicant's written, detailed explanation is in Items 8, 9 and 13 below. Claims 27/1, and 27/3 were similarly rewritten and combined into new independent claims 36 and 37.

Claim 11 has been corrected to eliminate the improper multiple dependency, and now is properly dependent on independent claims 9, 10 , and new independent claims 31 and 32, which the Examiner indicated would be allowable.

Similarly, to eliminate the improper multiple dependency, claim 28 was canceled and rewritten as new independent claim 38, combining former claim 3 and corrected claim 28. Applicant's explanation is in Item 2 below.

No new matter has been added.

Before taking up the claims in detail, attention will be given to the prior art patents, cited by the Examiner.

Item 2

Claim 11 has been corrected, and claim 28 has been canceled and rewritten as new independent claim 38, to eliminate the improper multiple dependency of both claims, as described above.

The major difference from the prior art patent of Tangri (US 4,085,709) is in the low pressure of the whole system, comprising electrolyzer and hydrogen storage. Hydrogen goes directly from the electrolyzer into an absorbent , such as a mixture of metal hydride, graphite and MCMBs at low pressure, without using the prior art bulky and unsafe compression system. Applicant's static system is smaller, safer , simpler, silent, and longer lasting , due to no moving parts. No new matter has been added, and both claims are fully supported by the Specification, Pages 32-35, and Fig. 25.

Tangri, West (US 3,517,766) and Munday (US5,143,025) do not suggest the system or vehicles of applicant as claimed. Therefore, the Examiner is requested to consider these claims for allowance.

Item 3

Claims 1-6, 26 and 27 have been corrected, or rewritten as new claims 31-37.

The last sentence in claims 1-3 : " ,which does not have said electric propulsion system" was removed as unnecessary, after discussion with the Examiner.

Applicant added this sentence previously only after the Examiner's request in his prior action of June 18, 2003, page 2, Item 2, lines 1-6.

Item 5

Claims 1-3 were rejected by the Examiner as unpatentable, as an obvious combination of the two prior art patents of West (US 3,517,766) and Munday (US 5,143,025). Claims 1-3 are canceled at this time. Applicant will file a continuation of this Application with a better explanation of this invention in relation to the prior art, as discussed with the Examiner.

Items 6 & 7

Applicant agrees with the Examiner, that carbon graphite and metal hydride are known hydrogen absorbents. Claims 4 and 5 are cancelled.

Item 8

Applicant defends the claims 27/1 and 27/3, now rewritten as new independent claims 36 and 37, as described in his prior Amendment of September 18, 2003, page 14, Item 12, and still believes that the Examiner misunderstood the principle of the invention.

The Examiner's references to West, Munday, Kerrebrock at al. (US 5,372,617) and Gallager (US 3,895,102) are in error.

West and Munday are discussed in Item 5, but a major difference in claims 36 and 37 is in the hydrogen generator principle and Gallager' use of catalyst.

First, Kerrebrock at al. uses reaction of sodium borohydride and water to produce

hydrogen. Kerrebrock exposes sodium borohydride to water.

Applicant does not use this reaction to produce hydrogen. Applicant slowly dissolves sodium borohydride in water. For example 20 % of NaBH₄ by weight. When dissolved in water, a mild reaction occurs, which creates a small amount of heat and some hydrogen. Most of the NaBH₄ stays dissolved in water, non-reacted. This solution is non-flammable and therefore safe in a vehicle, and has the energy density of gasoline.

Applicant uses this solution to be exposed to a metal catalyst (or vice versa), such as ruthenium, to trigger the reaction releasing a large quantity of hydrogen (H₄), on demand only. Applicant's metal catalyst is not consumed, and can be used over and over with a new solution, unlike Gallager's catalyst with reagent, which is consumed and discarded.

Applicant produces hydrogen in two steps:

1. First he makes a safe solution of sodium borohydride in water.
2. Then contacts this solution with a metal catalyst, which contact releases the hydrogen, the resulting byproduct being only borax soap in water.

Kerrebrock produces hydrogen in one step, even if combined with the catalyst of Gallager. The major difference is in applicant's hydrogen safe storage, and in the use of a catalyst.

Applicant does not control the rate of generation of hydrogen by the catalyst, as the Examiner stated. Applicant controls the rate of generation by the amount of the solution allowed to contact the catalyst in the modified Kipp reactor, as described in the Specification (Page 24, lines 2-14, and Fig. 16A), i.e. by the valve 169.

Applicant does not use nor claim any electric power usage for his reaction.

In any case, none of the references cited by the Examiner suggest the combination and result, or invention of applicant as claimed.

Applicant therefore believes, that claims 36 and 37 with all of their limitations should be allowed.

Item 9

Applicant defends claims 29 and 30 the way as in Item 8, except they are directed to fuel cell vehicles, and believes that they should be allowed, as they are supported by the Specification.

Item 10

Applicant's Application # 08/950,445 was rejected and an Appeal to Federal District Court was also rejected. Consequently, Application # 08/950,445 is abandoned. Therefore the double patenting rejection is no more an issue.

Item 12

Claims 6 and 26 have been rewritten as new claims 31-35, as discussed with the Examiner and described on page 17 of this Amendment.

Item 13

In response to the Examiner's notes directed to claims 1-3, in the Examiner's Action of June 18, 2003, page 3, line 15, the Examiner mentioned " a vehicle having constituent drive elements of smaller capacity", suggesting that such vehicle would have a shorter range, than a vehicle with large capacity elements. Although the Examiner did not specifically wrote the words "less fuel", applicant inquired :
" how can a vehicle with smaller capacity drive elements have a shorter range, if it consumes less fuel ?"

In response to the unexpected results achieved, the Examiner stated that applicant's arguments can not take the place of evidence. However, in this case it is so simple, that the evidence is selfevident, and any "measurements" are not necessary. After reading applicant's disclosure, it is selfevident to any engineer or any person skilled in the art, that a smaller engine consumes less hydrogen, than a large engine, and thus results in a longer range of the vehicle, on the same amount of hydrogen.

Applicant's electric hybrids as claimed, permit the use of a smaller engine.

An actual example of achievable mileage range is given in the Specification, page 29, line 25, when a 3x smaller engine is used , as compared to a standard size engine required to drive a given vehicle. For the sake of clarity, additional explanation of the applicant's vehicle range, as compared to other prior art zero emissions vehicles is also given in the Secondary Considerations Letter of applicant, filed on July 12, 2003 at the PTO, which is incorporated herein.

Claims 1-3 are now incorporated into new claims 31-38.

As regards the Examiner's references to Kerrebrock at al. and Gallagher, the differences in applicant's invention and the above mentioned prior art are explained in Item 8. Major differences are in safety and the use of a catalyst : Kerrebrock's sodium borohydride powder is very flammable and dangerous when exposed to air , which is well known. Applicant's solution of sodium borohydride in water is non-flammable in air and therefore safe. Gallagher's metal catalyst in ferrosilicon is consumed by the reaction and discarded. Applicant's metal catalyst is not consumed and may be used over and over with a fresh solution . The proof is in well known fact, that metals , such as ruthenium are not soluble in water, and that the borax (sodium boroxide) as described compound , does not contain any ruthenium or other metal catalyst in its formula.

How to make the solution is not described, not claimed , because it is not beyond the skill of an ordinary artisan to dissolve a salt in water.

Applicant does not claim how to make the solution, but claims its use in combination with a metal catalyst, and hybrid - electric vehicle or fuel cell (FC) vehicle, as supported by the Specification, page 26, lines 2-14.

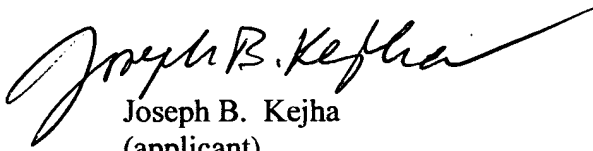
Therefore the Examiner is respectfully requested to reconsider the rejection of claims 27/1 , 27/3 (now new claims 36 , 37) , 29 and 30 , on the merit of applicant's hydrogen generator principle in combination with HEVs and FC vehicles , and allow them.

Item 14

Applicant has corrected claim 11 and rewritten claim 28 as new claim 38, as explained in Item 2, to eliminate the improper multidependency. No new combination or new matter was added.

It is believed, that all the claims in this Amendment define new and unobvious matter. Accordingly, it is believed, that the Amendment places the Application in condition for allowance and such action is requested and urged.

Respectfully submitted,


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(applicant)